Section 5: Year 2000 and Electric Utilities

Introduction

The year 2000 problem, or Y2K, is a result of computer and chip programming which uses a two-digit year in date fields that in turn may cause computer disruption before or on January 1, 2000. This problem affects computers, computer applications, and processors embedded in a variety of common devices. It also means that a business' Y2K problems could impact its customers and competitors. A now anonymous person once dubbed electricity the "long pole in the Y2K tent." The reason is simple: if government, businesses, and individuals have electrical power during the transition into the next century, they will be able to deal with their own Year 2000 issues. The North American Electric Reliability Council, in its September 1998 report to the U.S. Department of Energy, perhaps said it best:

> *"So what is so unique about Y2K in the electric industry? First, electricity is the lifeblood of our modern society. United States Senator Robert F. Bennett of Utah, a leading advocate for aggressively attacking the Y2K bug, has rightly noted that the electric industry is the highest priority for maintaining the operations of critical infrastructure. Without a reliable supply of electricity, the Y2K problems in other industries become secondary, especially if all those computers and electronic devices society depends on every day don't have any electricity to run them. There is no doubt that our North American society has come to expect and fully depend on electric service reliability that meets the highest standards in the world.*
>
> *The second unique aspect of power systems is that electricity is the original and ultimate example of "just-in-time" manufacturing. Electricity cannot be stockpiled in large quantities like other commodities, such as water, gasoline, clothing, and paper. This real-time production requirement greatly increases the complexity of production (generation), transportation (transmission), and delivery (distribution) of electricity. At the instant someone turns on a light or their PC, the additional electricity required must be immediately available from a generating station that may be hundreds of miles away."*

While there are a large number of variables, the general outlook regarding electricity in the Northwest on January 1, 2000, is cautiously optimistic. Much more information with which to assess the region's readiness will be available in the early months of 1999.

To understand the impact of the Year 2000 electric issues on Washington State, it is helpful to understand some background about the utilities in Washington State and the electric system in the western United States.

Electric Utilities in Washington State

Washington State has 64 electric companies that fall into four different categories.

- Investor-owned utilities (IOUs) are private corporations owned by shareholders and regulated by the Utilities and Transportation Commission.
- Public Utility Districts (PUDs) are units of local government, governed by elected officials.
- Municipal utilities are much like PUDs except they are ultimately governed by elected city councils, not separately elected officials.
- Rural Electric Cooperatives (Co-ops) and Mutuals are private corporations owned by customers and regulated by elected commissions.

Appendix A provides a listing of Washington electric utilities, class of ownership, number of customers, revenue, and sales.

The Western Systems Coordinating Council

Eleven utilities that deal in bulk power generation and transmission covering nearly 80% of the electrical sales in Washington State belong to the Western Systems Coordinating Council (WSCC). WSCC is the international organization that promotes electric system reliability in the western United States. WSCC was formed in 1967 and is the largest and most diverse of the nine regional electric reliability councils that comprise the North American Electric Reliability Council (NERC). *See Figure 1.* NERC provides a forum for its members to enhance communication, coordination, and cooperation for planning and operating a reliable interconnected electric system. Membership is voluntary and open to major transmission utilities, transmission dependent utilities, and independent power producers/marketers. Affiliate membership is available for power brokers, environmental organizations, state and federal regulatory agencies, and any organization having an interest in the reliability of interconnected system operation or coordinated planning. WSCC encompasses electric systems serving all or part of 14 western states, British Columbia and Alberta, Canada, and Baja California Norte in Mexico. The regional councils created NERC in 1968 to coordinate the efforts of the regional councils, to set national standards for electric system operation, and to monitor voluntary compliance with those standards.

The WSCC differs from most regional reliability organizations in that it also one of the three regional interconnections in North America. *See Figure 2.* This means that system security problems caused by operations in the WSCC region cannot have any effect on operations outside of the region. It is a fairly isolated system with just six relatively weak links to the eastern interconnection. It also means that the voluntary standards developed by the WSCC are applicable to every party whose action can have a negative impact on WSCC reliability. This stands in contrast to the situation in the eastern interconnection, where rules and standards are developed by seven different regional reliability organizations, and each region is vulnerable to the actions of companies in neighboring regions. The unique situation in the WSCC has resulted in a unique set of institutional relationships in the western interconnection. Solutions to transmission system operational issues have traditionally been devised and implemented on a consensus basis within the western inter-

connection, with a minimum of oversight from outside parties. The utilities in the WSCC work together constantly and are on a first name basis with each other. WSCC members report their Year 2000 readiness activities to the North American Electric Reliability Council on a quarterly basis.

North American Electric Reliability Council

NERC provided information on electric utility Y2K prepardness in its September 1998 report to the U.S. Department of Energy. Their second report is dated January 11, 1999. NERC believes Y2K impacts on electrical systems may be less than originally anticipated, if mitigation of operating risks and contingency planning are carried out within the industry. Therefore, NERC recommends that electric utilities accelerate the pace of Y2K inventory and assessment so that remediation and testing may be completed by May 31, 1999, and that critical systems and components are Y2K ready by May 31, 1999.

NERC has developed a guide to contingency planning that addresses staffing and operation of the power system on critical Y2K dates. The contingency plans will be implemented by each of the NERC regions, (the WSCC for the Northwest), and Y2K work will be coordinated at interconnection, regional, and organizational levels. In addition to coordination within the electric industry, coordination needs to be stepped up between the industry and external communication providers, suppliers of natural gas and oil, and rail transportation of coal.

NERC's work plan of Y2K activities includes continuing to coordinate with trade associations and regional reliability councils, including establishing compliance deadlines. The council is also urging federal, state, provincial and local government in the U.S., Canada, and Mexico to coordinate efforts with electric utilities.

Challenges to achieving Y2K readiness include:

- The sheer amount of complex work remaining.
- The large number of operating systems. Currently, the industry consists of 3,200 organizations, including about 200 operators of bulk electric systems.
- Industry restructuring that introduces wholesale and retail competition for electricity.
- Lack of sharing of technical information on Y2K problems and solutions among system operators and suppliers. The primary concern is the heavy threat of litigation over issues such as due diligence and product defamation.
- Close coordination with related industries, such as telecommunications, railroads, and other energy suppliers.

Because of its over-arching national and regional role with electric organizations, NERC has made the following recommendations to federal, state, and local governments:

- Allow the industry to continue managing Y2K efforts. Government requirements for additional reporting will dilute already strained resources.

- Provide immediate legislation or alternative legal measures to protect the electric industry from litigation related to Y2K information shared in good faith.
- Consider Y2K preparedness in any new regulatory legislation.
- Temporarily suspend aspects of electric market operations during critical Y2K hours or days.
- Temporarily suspend aspects of environmental regulations that restrict or prohibit operation of generating stations when emissions monitoring systems are unavailable.
- Use of nuclear power during Y2K transition periods.

Figure 1. North American Electric Reliability Regional

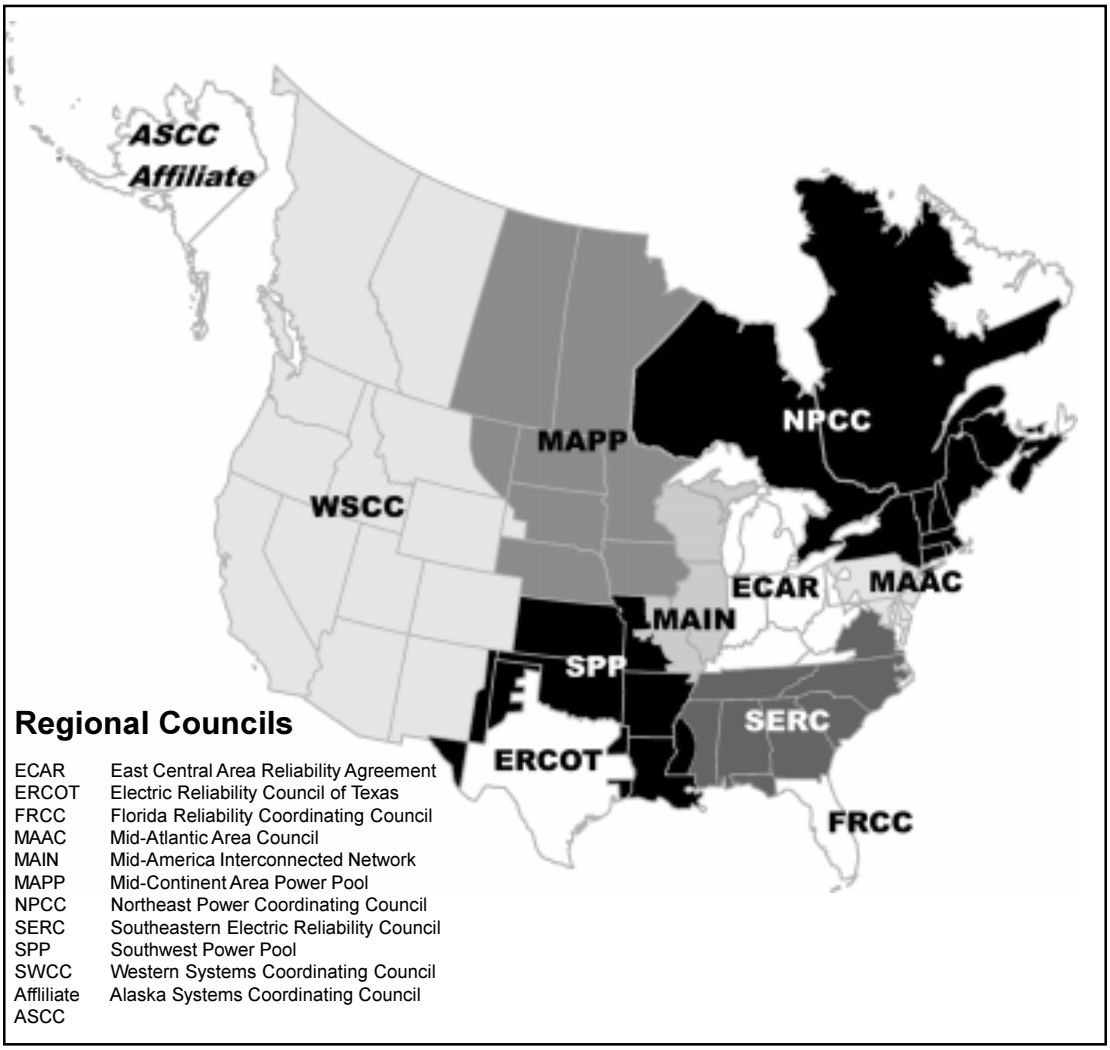

Figure 2. Three Major Electrical Interconnections of North America

Bonneville Power Administration

The Bonneville Power Administration (BPA) owns and operates 80 percent of the electric transmission system in the Northwest. Obviously, BPA is a key player in coordinating Year 2000 activities in this region and has provided the following information regarding its Y2K activities.

Y2K Preparedness

The Bonneville Power Administration (BPA) has been working since 1995 to prepare for the year 2000 and related dates. In 1995, BPA conducted an inventory of all its automated business systems, identified systems critical to its operations, and began to plan for replacing, upgrading or discontinuing those with Y2K problems. BPA appointed a cross-agency Y2K team with executive-level sponsorship and hired a chief information officer whose major responsibility is leading the Y2K effort and making BPA systems and equipment Y2K ready.

The team developed a year 2000 readiness plan based on a "defense in depth" philosophy that incorporates five key points:

1) Use of a methodical process to find and fix Y2K problems

2) Increase scrutiny of critical systems' transmission reliability

3) Coordinate with entities that have significant effect on transmission

4) Develop contingency plans for operating the transmission system

5) Develop comprehensive emergency plans

Testing and Remediation

BPA's Y2K testing guidelines were adapted from national standards set by CANUS/ Utilities Services Alliance, Inc., BPA is reviewing all critical equipment for Y2K readiness, including power system control and protection, communications, control centers and business and support systems. Some problems have been found and are being corrected.

BPA's methodical requirements call for every system to be tested, at a minimum, for two dates: January 1, 2000, and February 29, 2000. Global Positioning System (GPS) receivers must also be tested August 21 – 22, 1999. More tests may be done as applicable to specific systems. The plan includes thorough documentation and quality control. All testing and remediation is to be done by March 1999.

BPA has made changes to the sub-station control and data acquisition system (SCADA), the equipment at BPA control centers which communicates with and controls transmission operations at 187 of BPA's 363 substations. The SCADA at BPA's Munro control center was updated when the center was moved from Moses Lake to Spokane in 1996, while the Dittmer SCADA was updated in 1998. Testing is currently underway at BPA's testing and training center in Vancouver, Washington and at field sites to determine the readiness of the more than 2,400 pieces of equipment in BPA's system that contain embedded chips.

Contingency Planning

More than 80 percent of BPA's power is hydropower, which is a distinct advantage for Y2K planning and implementation. Hydro plants can be on line in minutes and stay on line longer when power system problems occur. Large thermal plants, by contrast, can take hours to start up.

All BPA control centers, major substations, major generation and large utilities have dedicated communications systems and use analog microwave immune to Y2K problems, plus UHF and VHF radio. Operators also use cellular and dial telephones. BPA can operate the power system manually using people on site as long as voice communication is available.

BPA and other WSCC members are developing a regional contingency plan based on NERC's guidelines. A preliminary draft WSCC Y2K contingency plan was to have been completed before January 1, 1999. BPA is developing its own Y2K contingency plan based on the NERC and WSCC Y2K plans, as well as BPA's emergency preparedness guide and restoration plan. If computer systems fail, local control and protection, such as generation governors and protection relays, can provide backup.

Coordination with Suppliers and Customers

BPA is coordinating with the U.S. Corps of Engineers, the Bureau of Reclamation, and Washington Public Power Supply System to ensure that they provide reliable sources of generation. BPA is also coordinating with customers at all major interconnection points on the system.

January 1, 2000 and BPA's Electric Power Operations

BPA's goal is that homes and businesses in the Pacific Northwest will operate with no electrical disruption on critical Y2K dates. With methodical testing and remediation, thorough contingency planning and coordination with suppliers and customers, BPA is planning for Y2K to be a "non-event" for the region's power system.

Washington Investor-Owned Utilities and the Utilities and Transportation Commission

Companies providing electricity, natural gas and telecommunications are regulated by the Washington State Utilities and Transportation Commission (UTC). Therefore, the UTC is taking steps to ensure that service essential to residents and businesses is not interrupted by Y2K.

The UTC strives to ensure that utility and transportation services are fairly priced, available, reliable, and safe. To accomplish this, the Commission regulates rates, terms and service conditions of investor-owned providers of electrical, natural gas, telephone, solid waste, water, household good moving, private ferry and bus services. It also regulates the safety of railroad companies operating in Washington State.

The UTC **does not** regulate rates or operation of publicly- or municipally-owned utility or transportation services, including city-owned water, sewage or garbage services, or water or electrical service provided by a public utility district or cooperative. Furthermore, the UTC **does not** regulate cellular or wireless telephone or cable television companies.

Electric companies regulated by the UTC in Washington include Puget Sound Energy, Pacificorp, and Avista (formerly Washington Water Power Company).

The purpose of the Commission's Y2K review is to notify network-based companies, such as those that supply electricity, natural gas and telecommunications, that the Commission fully expects they will prepare for Y2K so that service disruptions to customers will be avoided. In light of these expectations, the UTC has:

- Initiated in December 1997, a staff investigation into public service company analysis of Y2K computer issues.
- Conducted in February 1998, a public hearing to receive status reports from major facility-based public utilities on their preparation to provide uninterrupted service. Staff focused their efforts on facility-based utilities because of the direct effect that potential service interruptions would have on customers.
- Ordered in June 1998, the following, based on staff recommendations:
  1. Major facility-based public utilities operating in Washington to begin quarterly reporting on the status of their Y2K efforts. The first reports were submitted in June 1998.
  2. Utilities to notify their business customers of the need to bring their utility-related equipment into Y2K compliance no later than September 30, 1998.
  3. Utilities to submit their Y2K service restoration contingency plans to the Commission for review no later than December 1998.
  4. Commission staff to coordinate with other public organizations and the media to ensure information is made available to the public to assist them in their Y2K preparations.
- Ordered utilities to add or update their Internet sites to include a Web page devoted to year 2000 compliance efforts. Information on the page must include quarterly reports filed with the UTC, and other relevant information to assist customers in assessing potential Y2K problems.

Public Utility Districts

The Washington Public Utility District Association reports that it is absolutely committed to 'keeping the lights on' and maintaining the reliability of the electric and water systems that public utility districts (PUD) manage in the face of the Y2K challenge.

Whether a PUD is large or small, a generating or non-generating utility, all PUDs are making preparations for January 1, 2000. The integrated nature of the electrical system, however, makes it virtually impossible to issue any assurances as certain parts of the system, such as non-utility owned transmission and generation, are out of any individual utility's control. This makes it imperative that every utility examine and address Y2K shortcomings that are uncovered. Therefore, each association member is working with other utilities, trade associations, vendors, and consultants to be ready for Y2K. PUDs are researching Y2K impacts in several areas. Generation, transmission, distribution, and billing and customer information systems are the

key components that have been identified as needing examination, testing and remediation. Each PUD is also going through the following Y2K checklist:

- Inventory systems and applications
- Assess Y2K impact
- Select remedial action, such as upgrades and replacement of equipment
- Establish priorities for modifications
- Identify critical events and establish critical completion dates
- Communicate with customers through bill stuffers, newsletters and board meetings
- Monitor progress and record efforts
- Assess impact from outside sources
- Communicate and work with vendors and suppliers
- Make contingency plans
- Evaluate legal position

Member utilities are also planning for their human resource needs for December 31, 1999. Extra work crews and office personnel will be deployed in case Y2K does cause electrical disruption.

Municipal Utilities — Association of Washington Cities

The Association of Washington Cities (AWC) reports that it has developed an aggressive plan to give cities and towns the tools and resources needed to solve their Y2K problems. This plan includes:

- Conducting classroom and on-site training as issues and specific needs emerge. In September 1998, AWC hosted a Y2K awareness-project management workshop in Moses Lake and Tukwila for 220 city and county officials. Workshops on contingency planning are scheduled for January 1999, at the same sites.
- Maintaining a networking resource group for western Washington cities and counties so local governments can share information easily. Eastern Washington cities aren't able to participate as easily; however meeting minutes are e-mailed to those Y2K coordinators. In 1998, the group met with Puget Sound Energy, U.S. West, and U.S. Bank. In 1999, AWC is considering bringing in officials who administer the Federal Emergency Management Act.
- Distributing information quickly via e-mail to more than 130 city and county Y2K coordinators.
- Providing technical assistance through consultants to small cities and towns with less than 5,000 residents. AWC pays a portion of consultant services.
- Collecting inventory items from cities and entering them into a shared database.

- Creating information packets so cities don't have to reinvent the wheel. For example, small cities received sample vendor letter packets and will receive a community awareness kit.
- Working with the state to connect cities into a regional contingency plan so they are in sync with state and county plans.
- Concise monthly updates to heighten Y2K awareness among municipal managers.
- Keeping in contact and sharing information with utilities, public works directors and police and sheriffs associations.

AWC has provided the following descriptions of several key municipally-owned utilities and how they are complying with Y2K preparedness plans:

- **Seattle City Light:** Began Y2K evaluation in 1995. Inventory completed of all software application systems and corrections to identified problems are underway. New energy management system has been installed and will be tested in March 1999, along with customer accounts, billing and service systems. Meter reading system to be compliant by June 1999. Contracts of non-compliant vendors are being reviewed. Operational plans in place to handle generation and transmission outages and to activate manual operations. Special staffing plan being developed for December 31, 1999, to January 1, 2000. Contingency plan to limit import and export of power, although utility will obtain power from the Skagit if necessary.
- **Tacoma Power:** Plan in place based on Western Systems Coordinating Council guidelines to prevent and address any disruption of service caused by city systems. Includes developing an exhaustive inventory of all hardware and software that might be affected by Y2K, including calibration equipment, protective relays, communication and control systems, and financial and billing functions. The city's goal is to have all critical systems Y2K ready by July 1999.
- **Port Angeles City Light:** Conducting inventory of equipment, evaluating priorities and getting documentation from suppliers. The current schedule calls for compliance and a completed contingency plan by June 1999.
- **Centralia City Light:** Does not have a lot of automated equipment, and everything can be manually operated. Software that runs the turbines is Y2K compliant and contingency plans have been completed.
- **City of Ellensburg**: Completed a prioritized list of vital, critical and non-critical services based on the American Public Power Association guidelines. An equipment inventory using the prioritized lists was to have been completed by January 1, 1999.

Rural Electric Cooperatives

The Washington Rural Electric Cooperative Association reports that electric co-operatives and mutuals in the state have been working on becoming Y2K compliant for well over a year now. Many of the co-op systems are well ahead of schedule for completing their testing and system improvements. Most of them started with computers and other office equipment. There have been several major changes of equipment, partly to ensure that systems are Y2K compliant. In addition, co-ops are in the process of addressing Y2K issues with members.

Co-ops have received assistance from a number of government agencies and private companies. Those that borrow from the Rural Utilities Service (RUS) program, which is part of the U.S. Department of Agriculture, were required to file an initial report several months ago and to adhere to a compliance schedule. The National Rural Electric Cooperative Association has hosted training seminars and provided consulting services to help co-ops meet deadlines. In addition, their main private banking partner, the Cooperative Finance Corporation (CFC), has worked with borrowers to make sure they will be ready on time. They have also participated in programs sponsored by the Northwest Public Power Association (NWPPA), the National Energy Reliability Council (NERC), the Electric Power Research Institute (EPRI) and several private companies.

Washington co-ops buy all or most of their power from the Bonneville Power Administration. BPA is also responsible for delivering power to co-ops, which do not own any generation or transmission lines. Consequently, co-ops have been working with BPA to ensure uninterrupted delivery of wholesale power after December 31, 1999.

Co-ops have contingency plans as well, including extra staffing on Janurary 1, 2000. All equipment can be manually operated, which means that if an embedded chip causes a problem, the equipment can still function.

Summary

In the electric utility arena, overall coordination of Y2K issues in the Northwest are being conducted at the national and regional levels by the North American Electric Reliability Council (NERC) and the Western Systems Coordinating Council (WSCC). NERC has set standards and guidelines for each phase of Y2K assessment, testing and contingency planning, and has recommended that government, communications, transportation and other energy-related industries be included in electric companies' Y2K activities. WSCC member utilities report their progress on Y2K programs to NERC monthly and on a quarterly basis regarding their Y2K preparedness activities.

Washington State has some particular advantages and disadvantages regarding Y2K issues. One advantage is that electric industry players that operate in Washington report that they are working diligently on finding and fixing Y2K problems within their generation, transmission, and delivery systems. Electric utilities have found that the majority of their equipment used in power delivery and might be affected by Y2K are at the generation and transmission segments of the industry.

Some of the state's major systems, such as the Bonneville Power Administration and Seattle City Light, have been working on Y2K compliance since 1995. Another advantage Washington State has is that the bulk of our electricity comes from hydro power, which is easier to restart than other forms of energy in the event of a power failure. A final advantage is that because of its geographical location, the Northwest will be able to observe the types of Y2K problems occurring elsewhere in the world and in the U.S. before midnight of December 31, 1999, and make adjustments accordingly.

Other Y2K preparedness activities are being conducted by a host of electric industry-related organizations through the state. The Washington State Utilities and Transportation Commission, which regulates privately-owned electricity, communications and transportation entities, has required quarterly reporting of Y2K efforts and contingency plans by those industries. Public utility districts are going through detailed preparedness checklists and have plans for additional staff to be on hand during critical Y2K dates. The Association of Washington Cities has a comprehensive Y2K program and is working with municipally-owned electric utilities, including Tacoma, Seattle, Ellensburg, Centralia, and Port Angeles, to coordinate plans with utilities, city managers, public works directors and other city officials. Meanwhile, most rural electric cooperatives, with the help of public and private partners, are reportedly ahead of schedule in Y2K testing and compliance.

Washington State also has some particular disadvantages regarding Y2K compliance. First, because of the is the great number and variety of institutions that are responsible for electric service throughout the state, coordination and accountability may be challenging. There is no state wide mechanism for ensuring that electrical systems meet compliance deadlines. The nature and extent of potential interruptions in power supply and delivery and are difficult to foresee with accuracy. Additional challenges include non-compliant suppliers and vendors to electric systems and confidence in the accuracy of reporting among those who have submitted information to electric utilities. For example, one of the state's largest utilities, Seattle City Light, has only begun to address the issue of non-compliant vendors while Port Angeles City Light reports that only 50 percent of suppliers have submitted Y2K documentation and that some of the information is 'suspect.' Finally, while many utilities have ensured that equipment can be operated manually, it is unclear whether personnel have been given the training to do so.

In conclusion, it is imperative for smooth continuation of electricity delivery into the new millenium that electric utilities operating in Washington State continue thorough Y2K planning efforts as called for by national industry guidelines. In addition, utilities must continue to work closely with their customers and vendors to ensure that all elements of providing electric power in the Northwest are as prepared as possible for the Year 2000 transition.

Electric Utility Y2K Websites

Electric Utilities and Year 2000	http://www.euy2k.com
EPRI Year 2000 Issues for Embedded Systems	http://year2000.epriweb.com/index.html
North American Electric Reliability Council	http://www.nerc.com/y2k/y2k.html
Washington Utilities and Transportation Commission	http://www.wutc.wa.gov/y2k
Washington State Department of Information Services Y2K Program	http://www.wa.gov/dis/2000/aw